

Cosmetic Oligo- α -Olefin Containing Compound

Field of the Invention

This invention relates to new cosmetic compositions containing certain branched oligo- α -olefins and to the use of these branched oligo- α -olefins as oil components in cosmetic and pharmaceutical preparations.

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Prior Art

Consumers expect cosmetic skin- and hair-care emulsions to satisfy a range of requirements. Apart from the cleaning and skin-/hair-care effects which determine the intended application, value is placed on such diverse parameters as very high dermatological compatibility, good lipid-layer-enhancing properties, elegant appearance, optimal sensory impression and stability in storage.

Besides a number of surfactants, preparations used to clean and care for the human skin and hair contain, above all, oil components and water. The oil components/emollients used include, for example, hydrocarbons, ester oils and vegetable and animal oils/fats/waxes. In order to meet stringent commercial requirements in regard to sensory properties and optimal dermatological compatibility, new oil components and emulsifier mixtures are continually being developed and tested. A large number of natural and synthetic oils, for example almond or avocado oil, ester oils, ethers, alkyl carbonates, hydrocarbons and silicone oils, are used in the production of cosmetic or pharmaceutical preparations. A key function of the oil components – besides their care effect which is directly related to lipid layer enhancement of the skin – is to provide the skin of consumers with a non-sticky, almost instantaneous and long-lasting feeling of smoothness and suppleness.

The subjective feeling on the skin can be correlated and objectivized

with the physicochemical parameters of the spreading of the oil components on the skin, as illustrated by U. Zeidler in the journal **Fette, Seifen, Anstrichmittel** 87, 403 (1985). According to this reference, cosmetic oil components can be classified as low-spreading ($< 300 \text{ mm}^2/10$ mins.), medium-spreading (≥ 300 to $1000 \text{ mm}^2/10$ mins.) and high-spreading oils ($\geq 1000 \text{ mm}^2/10$ mins.). If a high-spreading oil is used as the oil component in a predetermined formulation, the required feeling of smoothness of the skin is achieved very quickly and, where cyclomethicones, for example Dow Corning 245 fluid (Dow Corning Corporation) or Abil® B 8839 (Goldschmidt Chemical Corporation), are used, a velvety feeling desirable to the consumer is also obtained. Unfortunately, the experience does not last long because the high volatility of the last-mentioned structures means that the pronounced feeling of smoothness and hence the velvety feel disappear very quickly, leaving the skin with an unpleasant, dull feeling.

However, cyclomethicones have the advantage over other hydrocarbon-based emollients, such as very light mineral oils, polybutylenes (for example Arlamol® HD, ICI), ethyl hexyl cyclohexane (Cetiol® S, Cognis Deutschland GmbH & Co. KG), that they have a very light feeling on the skin. Accordingly, there is a need for hydrocarbon-based oil components/emollients which combine the advantages of the cyclomethicones, such as a light feeling on the skin and good spreading properties, without having any of their disadvantages.

The use of tetraisobutylene in cosmetic compositions is known from **EP 1 232 739** or **EP 1 103 249**.

The problem addressed by the present invention was to provide improved, high-spreading oil components and preparations containing them which would impart an almost instantaneous and relatively long-lasting feeling of smoothness to the skin and which would show good dermatological compatibility. In addition, the oil components would lend themselves to simple and stable incorporation in emulsions, would be hydrolysis-stable in the event of pH variations and would lead to low-viscosity compositions imparting a very light feeling on the skin. Another

aspect of the stated problem was to provide oil components for antiperspirants/deodorants which would be comparatively unaffected by hydrolysis and would allow stable formulations in the presence of the astringent aluminium and zirconium compounds.

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Description of the Invention

The present invention relates to a cosmetic composition containing at least one branched oligo- α -olefin, characterized in that the side chains at one branch point at least are ethyl, propyl or longer branched alkyl chains,
10 the branched oligo- α -olefin being obtainable by oligomerization of

- a) at least one branched α -olefin containing 5 to 18 carbon atoms,
- b) at least one linear α -olefin containing 4 to 10 carbon atoms,
- c) a mixture of a branched α -olefin containing 4 to 18 carbon atoms
15 and a linear α -olefin containing 3 to 18 carbon atoms or
- d) a mixture of various branched α -olefins containing 4 to 18 carbon atoms and linear α -olefins containing 3 to 18 carbon atoms

in the presence of a catalyst selected from the group consisting of organic
20 acids, cationic ion exchangers, silica gels, layer silicates, inorganic acids or Lewis-acid-based catalysts.

The specific oligo- α -olefins are distinguished by particularly high spreading power, by an improved sensory impression of the final cosmetic formulation and by particularly good stability in antiperspirant/deodorant
25 formulations.

In the context of the present invention, oligo- α -olefins are understood to be dimers, trimers, tetramers, pentamers and hexamers of the α -olefins, the use of dimers, trimers, tetramers and pentamers being preferred. The conditions for the oligomerization and subsequent
30 hydrogenation are well-known to the expert. The production of oligomers using BF_3 -containing catalysts or metallocen catalysts is described, for example, in WO 98/20053, DE 27 026 04, US-A 5,068,490, US-A 5,286,823 or WO 85/01942. The reaction conditions are selected

according to the required degree of oligomerization and the required iodine value and are monitored and adjusted during the reaction by the usual analysis methods known to the expert.

5 The branched specific oligo- α -olefins used in the cosmetic composition according to the invention are odorless, colorless or yellowish products which may be liquid or solid according to chain length. There is no exact structural formula for the oligo- α -olefins because, basically, the oligomerization reaction gives product mixtures of which the fractions can be separated, for example, by distillation.

10 Suitable organic acid catalysts are, for example, p-toluenesulfonic acid, alkyl benzenesulfonic acid, methanesulfonic acid or C₂₋₄ mono-, di- or tricarboxylic acids, such as sulfosuccinic acid for example. Lewatit® SPC 112 (Bayer AG) is a suitable cationic ion exchanger. The Lewis-acid-based catalysts include, for example, boron halides, aluminium halides and
15 aluminium alkyl halides.

Preferred cosmetic compositions are those in which the branched oligo- α -olefin contains 12 to 36, preferably 12 to 24 and more particularly 14 to 24 carbon atoms. Cosmetic compositions based on branched oligo- α -olefins containing 16 to 20 carbon atoms are most particularly preferred.
20 In another preferred embodiment of the invention, the branched oligo- α -olefins resulting from the oligomerization are subsequently hydrogenated. The hydrogenation may be carried out on the technical product mixture directly resulting from the oligomerization. However, it may also be carried out after separation of the fractions by distillation. The additional
25 hydrogenation step leads to products with greater resistance to oxidation. Possible hydrogenation conditions are described, for example, in International application **PCT/EP02/11392**. Suitable catalysts are the hydrogenation catalysts known from the prior art, such as nickel or the noble metal catalysts, more particularly based on platinum or palladium.
30 Particularly suitable noble metal catalysts are palladium catalysts, more particularly palladium on coal.

Among the products obtained by oligomerization of the linear α -olefins b) containing 4 to 10 carbon atoms, tetramers are preferred.

Tetramers of 1-butene and 2-butene are particularly suitable. According to the invention, it is also preferred to use the oligo- α -olefins which are typically formed as secondary products during the polymerization of 1-butene or mixtures of 1-butene and 2-butene in the production of isotridecyl
5 alcohols and which can be isolated from the bottom product. An industrially practised process is, for example, the Octol process of UOP and Degussa-Höls AG in which C₃ and C₄ olefins are reacted on a catalyst, for example on phosphoric acid applied to SiO₂, at 30°C to 250°C/20 to 80 bar pressure to form higher olefins with a high degree of branching. This process is
10 described inter alia in **Petrochemical Processes, Vol. 1, Editions Technip (1989), pp. 183-187** and in **Hydrocarbon Processing, February 1992, pp. 45 – 46**.

In another preferred embodiment, the cosmetic composition contains branched oligo- α -olefins obtained by oligomerizing a mixture of a branched
15 α -olefin containing 5 to 12 carbon atoms and a linear α -olefin containing 3 to 12 carbon atoms in the presence of a catalyst selected from the group of organic acids, cationic ion exchangers, silica gels, layer silicates, inorganic acids or Lewis-acid-based catalysts and then optionally hydrogenating the oligomerization product.

20 Preferred linear α -olefins are selected from the group consisting of 1-propene, 1-butene, 2-butene, 1-pentene and 2-pentene. Preferred branched α -olefins are selected from the group consisting of 2-ethyl-1-hexene, 2-propyl heptene, 2-methyl-1-butene, 2-methyl-1-pentene, 3-methyl-1-pentene and 4-methyl-1-pentene.

25 Another preferred embodiment of the cosmetic composition contains branched oligo- α -olefins which are obtainable by oligomerizing a mixture of 80% butene and 20% isobutene in the presence of a catalyst selected from the group of organic acids, cationic ion exchangers, silica gels, layer silicates, inorganic acids or Lewis-acid-based catalysts and then optionally
30 hydrogenating the oligomerization product.

The specific branched oligo- α -olefins are eminently suitable for use as oil components in cosmetic or pharmaceutical preparations. Accordingly, the present invention also relates to the use of at least one

oligo- α -olefin obtainable by oligomerization of

- a) at least one branched α -olefin containing 5 to 18 carbon atoms,
 - b) at least one linear α -olefin containing 4 to 10 carbon atoms,
 - 5 c) a mixture of a branched α -olefin containing 4 to 18 carbon atoms and a linear α -olefin containing 3 to 18 carbon atoms or
 - d) a mixture of various branched α -olefins containing 4 to 18 carbon atoms and linear α -olefins containing 3 to 18 carbon atoms
- 10 in the presence of a catalyst selected from the group consisting of organic acids, cationic ion exchangers, silica gels, layer silicates, inorganic acids or Lewis-acid-based catalysts and subsequent hydrogenation of the oligomerization product,
- as oil components in cosmetic or pharmaceutical preparations, more
- 15 particularly in antiperspirant and/or deodorant formulations. The use of these oligo- α -olefins in antiperspirant formulations based on astringent aluminium and, in particular, aluminium/zirconium complexes leads to particularly storage-stable and hydrolysis-resistant compositions.

20 **Cosmetic preparations**

The compound according to the invention allows the production of stable cosmetic emulsions. These cosmetic emulsions are preferably body care formulations, for example in the form of creams, milks, lotions, sprayable emulsions, products for eliminating body odor, etc. The

25 compound according to the invention may also be used in surfactant-containing formulations such as, for example, foam and shower baths, hair shampoos and care rinses.

The cosmetic preparations may be formulated as emulsions or dispersions which contain water and the oil phase alongside one another.

30 Preferred cosmetic compositions are those in the form of a w/o or o/w emulsion with the usual concentrations – known to the expert - of oils/fats/waxes, emulsifiers, water and the other auxiliaries and additives typically used in cosmetic preparations.

The cosmetic composition according to the invention contains 1 to 50% by weight, preferably 5 to 40% by weight and more particularly 5 to 25% by weight oil of components which, together for example with oil-soluble surfactants/emulsifiers and oil-soluble active components, form part of the so-called oil or fatty phase. In the context of the invention, the oil components include fatty compounds, waxes and liquid oils, but not emulsifiers/surfactants. The poly- α -olefins may be present as sole oil component or in combination with other oils/fats/waxes. The percentage content of the at least one oligo- α -olefin, based on the total quantity of oil components, is 0.1 to 100% by weight and preferably 1 to 50% by weight. Quantities of 1 to 20% by weight are particularly preferred.

Depending on the particular application envisaged, the cosmetic formulations contain a number of other auxiliaries and additives, such as, for example, surface-active substances (surfactants, emulsifiers), other oil components, pearlizing waxes, consistency factors, thickeners, superfatting agents, stabilizers, polymers, silicone compounds, fats, waxes, lecithins, phospholipids, biogenic agents, UV protection factors, antioxidants, deodorants, antiperspirants, antidandruff agents, film formers, swelling agents, insect repellents, self-tanning agents, tyrosinase inhibitors (depigmenting agents), hydrotropes, solubilizers, preservatives, perfume oils, dyes, etc. which are listed by way of example in the following.

The quantities of the particular additives are governed by the particular application envisaged.

25 Surface-active substances

In another preferred embodiment, the cosmetic composition contains 0.1 to 20% by weight, preferably 1 to 15% by weight and more particularly 1 to 10% by weight of a surface-active substance or a mixture of surface-active substances.

30 The surface-active substances present may be anionic, nonionic, cationic and/or amphoteric or zwitterionic surfactants or emulsifiers or a mixture thereof. In surfactant-containing cosmetic preparations such as, for example, shower gels, foam baths, shampoos, etc., at least one anionic

surfactant is preferably present. Body-care creams and lotions preferably contain nonionic surfactants/emulsifiers.

Typical examples of **anionic surfactants** are soaps, alkyl benzene-sulfonates, alkanesulfonates, olefin sulfonates, alkylether sulfonates, glycerol ether sulfates, α -methyl ester sulfonates, sulfofatty acids, alkyl sulfates, fatty alcohol ether sulfates, glycerol ether sulfates, fatty acid ether sulfates, hydroxy mixed ether sulfates, monoglyceride (ether) sulfates, fatty acid amide (ether) sulfates, mono- and dialkyl sulfosuccinates, mono- and dialkyl sulfosuccinamates, sulfotriglycerides, amide soaps, ether carboxylic acids and salts thereof, fatty acid isethionates, fatty acid sarcosinates, fatty acid taurides, N-acylamino acids such as, for example, acyl lactylates, acyl tartrates, acyl glutamates and acyl aspartates, alkyl oligoglucoside sulfates, protein fatty acid condensates (particularly wheat-based vegetable products) and alkyl (ether) phosphates. If the anionic surfactants contain polyglycol ether chains, they may have a conventional homolog distribution although they preferably have a narrow-range homolog distribution. Typical examples of **nonionic surfactants** are fatty alcohol polyglycol ethers, polyglycerol esters, alkylphenol polyglycol ethers, fatty acid polyglycol esters, fatty acid amide polyglycol ethers, fatty amine polyglycol ethers, alkoxylated triglycerides, mixed ethers and mixed formals, optionally partly oxidized alk(en)yl oligoglycosides or glucuronic acid derivatives, fatty acid-N-alkyl glucamides, protein hydrolyzates (particularly wheat-based vegetable products), polyol fatty acid esters, sugar esters, sorbitan esters, polysorbates and amine oxides. If the nonionic surfactants contain polyglycol ether chains, they may have a conventional homolog distribution, although they preferably have a narrow-range homolog distribution. Typical examples of **cationic surfactants** are quaternary ammonium compounds, for example dimethyl distearyl ammonium chloride, and esterquats, more particularly quaternized fatty acid trialkanolamine ester salts. Typical examples of **amphoteric or zwitterionic surfactants** are alkylbetaines, alkylamidobetaines, amino-propionates, aminoglycinates, imidazolinium betaines and sulfobetaines. The surfactants mentioned are all known compounds. Information on their

structure and production can be found in relevant synoptic works in this field. Typical examples of particularly suitable mild, i.e. particularly dermatologically compatible, surfactants are fatty alcohol polyglycol ether sulfates, monoglyceride sulfates, mono- and/or dialkyl sulfosuccinates, fatty acid isethionates, fatty acid sarcosinates, fatty acid taurides, fatty acid glutamates, α -olefin sulfonates, ether carboxylic acids, alkyl oligo-glucosides, fatty acid glucamides, alkylamidobetaines, amphoacetals and/or protein fatty acid condensates, preferably based on wheat proteins.

10 Oil components

Body care preparations, such as creams, lotions and milks, normally contain a number of other oil components and emollients which contribute towards further optimizing their sensory properties. Suitable oil components are, for example, Guerbet alcohols based on fatty alcohols containing 6 to 18 and preferably 8 to 10 carbon atoms, esters of linear C_{6-22} fatty acids with linear or branched C_{6-22} fatty alcohols or esters of branched C_{6-13} carboxylic acids with linear or branched C_{6-22} fatty alcohols such as, for example, myristyl myristate, myristyl palmitate, myristyl stearate, myristyl isostearate, myristyl oleate, myristyl behenate, myristyl erucate, cetyl myristate, cetyl palmitate, cetyl stearate, cetyl isostearate, cetyl oleate, cetyl behenate, cetyl erucate, stearyl myristate, stearyl palmitate, stearyl stearate, stearyl isostearate, stearyl oleate, stearyl behenate, stearyl erucate, isostearyl myristate, isostearyl palmitate, isostearyl stearate, isostearyl isostearate, isostearyl oleate, isostearyl behenate, isostearyl oleate, oleyl myristate, oleyl palmitate, oleyl stearate, oleyl isostearate, oleyl oleate, oleyl behenate, oleyl erucate, behenyl myristate, behenyl palmitate, behenyl stearate, behenyl isostearate, behenyl oleate, behenyl behenate, behenyl erucate, erucyl myristate, erucyl palmitate, erucyl stearate, erucyl isostearate, erucyl oleate, erucyl behenate and erucyl erucate. Also suitable are esters of linear C_{6-22} fatty acids with branched alcohols, more particularly 2-ethyl hexanol and isopropanol, esters of C_{18-38} alkylhydroxycarboxylic acids with linear or branched C_{6-22} fatty alcohols, more especially Dioctyl Malate, esters of

linear and/or branched fatty acids with polyhydric alcohols (for example propylene glycol, dimer diol or trimer triol) and/or Guerbet alcohols, triglycerides based on C₆₋₁₀ fatty acids, liquid mono-, di- and triglyceride mixtures based on C₆₋₁₈ fatty acids, esters of C₆₋₂₂ fatty alcohols and/or

5 Guerbet alcohols with aromatic carboxylic acids, more particularly benzoic acid, esters of C₂₋₁₂ dicarboxylic acids with linear or branched alcohols containing 1 to 22 carbon atoms or polyols containing 2 to 10 carbon atoms and 2 to 6 hydroxyl groups, vegetable oils, branched primary alcohols, substituted cyclohexanes, linear and branched C₆₋₂₂ fatty alcohol

10 carbonates, such as Dicaprylyl Carbonate (Cetiol® CC) for example, Guerbet carbonates based on C₆₋₁₈ and preferably C₈₋₁₀ fatty alcohols, esters of benzoic acid with linear and/or branched C₆₋₂₂ alcohols (for example Finsolv® TN), linear or branched, symmetrical or nonsymmetrical dialkyl ethers containing 6 to 22 carbon atoms per alkyl group, such as Dicaprylyl

15 Ether (Cetiol® OE) for example, ring opening products of epoxidized fatty acid esters with polyols, silicone oils (cyclomethicone, silicon methicone types, etc.) and/or aliphatic or naphthenic hydrocarbons such as, for example, mineral oil, Vaseline, petrolatum, isohexadecanes, squalane, squalene or dialkyl cyclohexanes.

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Fats and waxes

Fats and waxes are added to the body care products both as care components and to increase the consistency of the cosmetic preparations. Typical examples of fats are glycerides, i.e. solid or liquid, vegetable or

25 animal products which consist essentially of mixed glycerol esters of higher fatty acids. Fatty acid partial glycerides, i.e. technical mono- and/or diesters of glycerol with C₁₂₋₁₈ fatty acids, such as for example glycerol mono/dilaurate, palmitate or stearate, may also be used for this purpose. Suitable waxes are inter alia natural waxes such as, for example, candelilla

30 wax, carnauba wax, Japan wax, espartograss wax, cork wax, guaruma wax, rice oil wax, sugar cane wax, ouricury wax, montan wax, beeswax, shellac wax, spermaceti, lanolin (wool wax), uropygial fat, ceresine, ozocerite (earth wax), petrolatum, paraffin waxes and microwaxes;

chemically modified waxes (hard waxes) such as, for example, montan ester waxes, sasol waxes, hydrogenated jojoba waxes and synthetic waxes such as, for example, polyalkylene waxes and polyethylene glycol waxes.

Suitable pearlizing waxes are, for example, alkylene glycol esters, especially ethylene glycol distearate; fatty acid alkanolamides, especially cocofatty acid diethanolamide; partial glycerides, especially stearic acid monoglyceride; esters of polybasic, optionally hydroxysubstituted carboxylic acids with fatty alcohols containing 6 to 22 carbon atoms, especially long-chain esters of tartaric acid; fatty compounds, such as for example fatty alcohols, fatty ketones, fatty aldehydes, fatty ethers and fatty carbonates which contain in all at least 24 carbon atoms, especially laurone and distearylether; fatty acids, such as stearic acid, hydroxystearic acid or behenic acid, ring opening products of olefin epoxides containing 12 to 22 carbon atoms with fatty alcohols containing 12 to 22 carbon atoms and/or polyols containing 2 to 15 carbon atoms and 2 to 10 hydroxyl groups and mixtures thereof.

Thickeners

Suitable thickeners are, for example, Aerosil® types (hydrophilic silicas), polysaccharides, more especially xanthan gum, guar-guar, agar-agar, alginates and tyloses, carboxymethyl cellulose and hydroxyethyl and hydroxypropyl cellulose, polyacrylates (for example Carbopols® and Pemulen types [Goodrich]; Synthalens® [Sigma]; Keltrol types [Kelco]; Sepigel types [Seppic]; Salcare types [Allied Colloids]), polyacrylamides, polymers, polyvinyl alcohol and polyvinyl pyrrolidone. Other consistency factors which have proved to be particularly effective are bentonites, for example Bentone® Gel VS-5PC (Rheox) which is a mixture of cyclopentasiloxane, Distearimonium Hectorite and propylene carbonate, and a sodium polyacrylate known as Cosmedia® SP. Other suitable consistency factors are electrolytes, such as sodium chloride and ammonium chloride.

Stabilizers

Metal salts of fatty acids such as, for example, magnesium, aluminium and/or zinc stearate or ricinoleate may be used as stabilizers.

UV protection factors and antioxidants

5 UV protection factors in the context of the invention are, for example, organic substances (light filters) which are liquid or crystalline at room temperature and which are capable of absorbing ultraviolet radiation and of releasing the energy absorbed in the form of longer-wave radiation, for example heat. UV-B filters can be oil-soluble or water-soluble. The
10 following are examples of oil-soluble substances:

- 3-benzylidene camphor or 3-benzylidene norcamphor and derivatives thereof, for example 3-(4-methylbenzylidene)-camphor;
- 4-aminobenzoic acid derivatives, preferably 4-(dimethylamino)-benzoic
15 acid-2-ethylhexyl ester, 4-(dimethylamino)-benzoic acid-2-octyl ester and 4-(dimethylamino)-benzoic acid amyl ester;
- esters of cinnamic acid, preferably 4-methoxycinnamic acid-2-ethylhexyl ester, 4-methoxycinnamic acid propyl ester, 4-methoxycinnamic acid isoamyl ester, 2-cyano-3,3-phenylcinnamic acid-2-ethylhexyl ester
20 (Octocrylene);
- esters of salicylic acid, preferably salicylic acid-2-ethylhexyl ester, salicylic acid-4-isopropylbenzyl ester, salicylic acid homomenthyl ester;
- derivatives of benzophenone, preferably 2-hydroxy-4-methoxybenzophenone, 2-hydroxy-4-methoxy-4'-methylbenzophenone, 2,2'-dihydroxy-
25 4-methoxybenzophenone;
- esters of benzalmalonic acid, preferably 4-methoxybenzalmalonic acid di-2-ethylhexyl ester;
- triazine derivatives such as, for example, 2,4,6-trianilino-(p-carbo-2'-ethyl-1'-hexyloxy)-1,3,5-triazine and Octyl Triazone or Dioctyl Butamido
30 Triazone (Uvasorb® HEB);
- propane-1,3-diones such as, for example, 1-(4-tert.butylphenyl)-3-(4'-methoxyphenyl)-propane-1,3-dione;
- ketotricyclo(5.2.1.0)decane derivatives.

Suitable water-soluble substances are

- 5 ➤ 2-phenylbenzimidazole-5-sulfonic acid and alkali metal, alkaline earth metal, ammonium, alkylammonium, alkanolammonium and glucammonium salts thereof and 2,2-(1,4-phenylene)-bis-1H-benzimidazole-4,6-disulfonic acid and salts thereof, more particularly the sodium salt;
- 10 ➤ sulfonic acid derivatives of benzophenones, preferably 2-hydroxy-4-methoxybenzophenone-5-sulfonic acid and salts thereof;
- sulfonic acid derivatives of 3-benzylidene camphor such as, for example, 4-(2-oxo-3-bornylidenemethyl)-benzene sulfonic acid and 2-methyl-5-(2-oxo-3-bornylidene)-sulfonic acid and salts thereof.

15 Typical UV-A filters are, in particular, derivatives of benzoyl methane such as, for example, 1-(4'-tert.butylphenyl)-3-(4'-methoxyphenyl)-propane-1,3-dione, 4-tert.butyl-4'-methoxydibenzoyl methane (Parsol® 1789) or 1-phenyl-3-(4'-isopropylphenyl)-propane-1,3-dione and enamine compounds. The UV-A and UV-B filters may of course also be used in the form of

20 mixtures. Particularly favorable combinations consist of the derivatives of benzoyl methane, for example 4-tert.butyl-4'-methoxydibenzoylmethane (Parsol® 1789) and 2-cyano-3,3-phenylcinnamic acid-2-ethyl hexyl ester (Octocrylene) in combination with esters of cinnamic acid, preferably 4-methoxycinnamic acid-2-ethyl hexyl ester and/or 4-methoxycinnamic acid

25 propyl ester and/or 4-methoxycinnamic acid isoamyl ester. Combinations such as these are advantageously combined with water-soluble filters such as, for example, 2-phenylbenzimidazole-5-sulfonic acid and alkali metal, alkaline earth metal, ammonium, alkylammonium, alkanolammonium and glucammonium salts thereof.

30 Besides the soluble substances mentioned, insoluble light-blocking pigments, i.e. finely dispersed metal oxides or salts, may also be used for this purpose. Examples of suitable metal oxides are, in particular, zinc oxide and titanium dioxide. Silicates (talcum), barium sulfate and zinc

stearate may be used as salts. The oxides and salts are used in the form of the pigments for skin-care and skin-protecting emulsions.

Besides the two groups of primary sun protection factors mentioned above, secondary sun protection factors of the antioxidant type may also be used. Secondary sun protection factors of the antioxidant type interrupt the photochemical reaction chain which is initiated when UV rays penetrate into the skin.

Biogenic agents

In the context of the invention, biogenic agents are, for example, tocopherol, tocopherol acetate, tocopherol palmitate, ascorbic acid, (deoxy)ribonucleic acid and fragmentation products thereof, β -glucans, retinol, bisabolol, allantoin, phytantriol, panthenol, AHA acids, amino acids, ceramides, pseudoceramides, essential oils, plant extracts, for example prunus extract, bambara nut extract, and vitamin complexes.

Deodorants

Deodorants counteract, mask or eliminate body odors. Body odors are formed through the action of skin bacteria on apocrine perspiration which results in the formation of unpleasant-smelling degradation products. Accordingly, deodorants contain active principles which act as germ inhibitors, enzyme inhibitors, odor absorbers or odor maskers.

➤ Germ inhibitors

Basically, suitable germ inhibitors are any substances which act against gram-positive bacteria such as, for example, 4-hydroxybenzoic acid and salts and esters thereof, N-(4-chlorophenyl)-N'-(3,4-dichlorophenyl)-urea, 2,4,4'-trichloro-2'-hydroxydiphenylether (triclosan), 4-chloro-3,5-dimethylphenol, 2,2'-methylene-bis-(6-bromo-4-chlorophenol), 3-methyl-4-(1-methylethyl)-phenol, 2-benzyl-4-chlorophenol, 3-(4-chlorophenoxy)-propane-1,2-diol, 3-iodo-2-propinyl butyl carbamate, chlorhexidine, 3,4,4'-trichlorocarbanilide (TTC), antibacterial perfumes, thymol, thyme oil, eugenol, clove oil, menthol, mint oil, farnesol, phenoxyethanol, glycerol

monocaprato, glycerol monocaprylate, glycerol monolaurate (GML), diglycerol monocaprato (DMC), salicylic acid-N-alkylamides such as, for example, salicylic acid-n-octyl amide or salicylic acid-n-decyl amide.

5 ➤ Enzyme inhibitors

 Suitable enzyme inhibitors are, for example, esterase inhibitors. Esterase inhibitors are preferably trialkyl citrates, such as trimethyl citrate, tripropyl citrate, triisopropyl citrate, tributyl citrate and, in particular, triethyl citrate (Hydagen® CAT). Esterase inhibitors inhibit enzyme activity and
10 thus reduce odor formation. Other esterase inhibitors are sterol sulfates or phosphates such as, for example, lanosterol, cholesterol, campesterol, stigmasterol and sitosterol sulfate or phosphate, dicarboxylic acids and esters thereof, for example glutaric acid, glutaric acid monoethyl ester, glutaric acid diethyl ester, adipic acid, adipic acid monoethyl ester, adipic
15 acid diethyl ester, malonic acid and malonic acid diethyl ester, hydroxycarboxylic acids and esters thereof, for example citric acid, malic acid, tartaric acid or tartaric acid diethyl ester, and zinc glycinate.

 ➤ Odor absorbers

20 Suitable odor absorbers are substances which are capable of absorbing and largely retaining the odor-forming compounds. They reduce the partial pressure of the individual components and thus also reduce the rate at which they spread. An important requirement in this regard is that perfumes must remain unimpaired. Odor absorbers are not active against
25 bacteria. They contain, for example, a complex zinc salt of ricinoleic acid or special perfumes of largely neutral odor known to the expert as "fixateurs" such as, for example, extracts of ladanum or styrax or certain abietic acid derivatives as their principal component. Odor maskers are perfumes or perfume oils which, besides their odor-masking function,
30 impart their particular perfume note to the deodorants.

Antiperspirants

 Antiperspirants reduce perspiration and thus counteract underarm

wetness and body odor by influencing the activity of the eccrine sweat glands. By virtue of their hydrolysis stability and compatibility with antiperspirant active principles, the specific oligo- α -olefins mentioned in claim 1 are particularly suitable for the antiperspirant sector. Accordingly, another preferred embodiment are cosmetic compositions, characterized in that they additionally contain at least one antiperspirant and/or deodorant active principle, preferably an aluminium-zirconium salt.

Suitable astringent active principles of antiperspirants are, above all, salts of aluminium, zirconium or zinc. Suitable antihydrotic agents of this type are, for example, aluminium chloride, aluminium chlorohydrate, aluminium dichlorohydrate, aluminium sesquichlorohydrate and complex compounds thereof, for example with 1,2-propylene glycol, aluminium hydroxyallantoinate, aluminium chloride tartrate, aluminium zirconium trichlorohydrate, aluminium zirconium tetrachlorohydrate, aluminium zirconium pentachlorohydrate and complex compounds thereof, for example with amino acids, such as glycine.

Antidandruff agents

Suitable antidandruff agents are piroctone olamine (1-hydroxy-4-methyl-6-(2,4,4-trimethylpentyl)-2-(1H)-pyridinone monoethanolamine salt), Baypival® (Climbazole), Ketoconazol® (4-acetyl-1-{4-[2-(2,4-dichlorophenyl) r-2-(1H-imidazol-1-ylmethyl)-1,3-dioxylan-c-4-ylmethoxyphenyl]-piperazine, ketoconazole, elubiol, selenium disulfide, colloidal sulfur, sulfur polyethylene glycol sorbitan monooleate, sulfur ricinol polyethoxylate, sulfur tar distillate, salicylic acid (or in combination with hexachlorophene), undecylenic acid, monoethanolamide sulfosuccinate Na salt, Lamepon® UD (protein/undecylenic acid condensate), zinc pyrithione, aluminium pyrithione and magnesium pyrithione/dipyrithione magnesium sulfate.

30

Insect Repellents

Suitable insect repellents are N,N-diethyl-m-toluamide, pentane-1,2-diol or 3-(N-n-butyl-N-acetylamino)-propionic acid ethyl ester), which is

marketed under the name of Insect Repellent® 3535 by Merck KGaA, and butyl acetylaminopropionate.

Self-tanning agents and depigmenting agents

- 5 A suitable self-tanning agent is dihydroxyacetone. Suitable tyrosine inhibitors which prevent the formation of melanin and are used in depigmenting agents are, for example, arbutin, ferulic acid, koji acid, coumaric acid and ascorbic acid (vitamin C).

10 Hydrotropes

In addition, hydrotropes, for example ethanol, isopropyl alcohol or polyols, may be used to improve flow behavior. Suitable polyols preferably contain 2 to 15 carbon atoms and at least two hydroxyl groups.

15 Preservatives

Suitable preservatives are, for example, phenoxyethanol, formaldehyde solution, parabens, pentanediol or sorbic acid and the silver complexes known under the name of Surfacine® and the other classes of compounds listed in Appendix 6, Parts A and B of the

- 20 **Kosmetikverordnung** ("Cosmetics Directive").

Perfume oils and aromas

- 25 Suitable perfume oils are mixtures of natural and synthetic perfumes. Natural perfumes include the extracts of blossoms, stems and leaves, fruits, fruit peel, roots, woods, herbs and grasses, needles and branches, resins and balsams. Animal raw materials, for example civet and beaver, and synthetic perfume compounds of the ester, ether, aldehyde, ketone, alcohol and hydrocarbon type may also be used.

30 Dyes

Suitable dyes are any of the substances suitable and approved for cosmetic purposes. Examples include cochineal red A (C.I. 16255), patent blue V (C.I. 42051), indigotin (C.I. 73015), chlorophyllin (C.I. 75810), quino-

line yellow (C.I. 47005), titanium dioxide (C.I. 77891), indanthrene blue RS (C.I. 69800) and madder lake (C.I. 58000). These dyes are normally used in concentrations of 0.001 to 0.1% by weight, based on the mixture as a whole.

5

Examples

Example 1

560 g 2-ethyl-1-hexene is oligomerized with Lewatit® SPC 112 (Bayer AG) for 3 hours at 100°C/10 bar pressure. 380 g of the resulting oligo- α -olefin are hydrogenated with 100 bar hydrogen for 12 hours at 200°C in the presence of 0.05% palladium on coal.

Example 2

700 g 2-propyl-1-heptene is oligomerized with Lewatit® SPC 112 (Bayer AG) for 3 hours at 100°C/10 bar pressure. 380 g of the resulting oligo- α -olefin are hydrogenated with 100 bar hydrogen for 12 hours at 200°C in the presence of 0.05% palladium on coal.

Example 3

500 g of an olefin mixture (90% by weight isobutene and 10% by weight 1-pentene) is oligomerized with Lewatit® SPC 112 (Bayer AG) for 3 hours at 100°C/10 bar pressure. 380 g of the oligomerized α -olefin are hydrogenated with 100 bar hydrogen for 12 hours at 200°C in the presence of 0.05% palladium on coal.

25

Example 4

500 g of an olefin mixture (80% by weight isobutene and 20% by weight 1-pentene) is oligomerized with Lewatit® SPC 112 (Bayer AG) for 3 hours at 100°C/10 bar pressure. 380 g of the oligomerized α -olefin are hydrogenated with 100 bar hydrogen for 12 hours at 200°C in the presence of 0.05% palladium on coal.

30

Example 5

500 g of an olefin mixture (80% by weight isobutene and 20% by weight 1-butene) is oligomerized with Lewatit® SPC 112 (Bayer AG) for 3 hours at 100°C/10 bar pressure. 380 g of the oligomerized α -olefin are hydrogenated with 100 bar hydrogen for 12 hours at 200°C in the presence of 0.05% palladium on coal.

Example 6

An oligo-1-but-1-ene is obtained from 1-butene in accordance with **WO 98/20053**. The tetramer is obtained from the oligomer mixture by fractionation.

To this end, triisobutyl aluminoxane is prepared in accordance with **EP-A- 575 356**. 35 g of a solution of isobutyl aluminoxane in heptane (3% by weight, based on Al; 38.9 mmol Al), 2.7 g trimethyl aluminium and 180 g 1-butene are successively introduced into a reaction vessel under an inert gas, followed by the addition of solid bis-cyclopentadienyl zirconium(IV) chloride (3.2 g). After heating for ca. 22 h to 50°C, 10% hydrochloric acid is added while cooling with ice. The organic phase is removed, the solvent is distilled off and the oligomer mixture is separated by fractionation into trimers, tetramers, pentamers and hexamers. The tetramer was hydrogenated as described in Examples 1 – 5.

Example 7

An oligo-1-pentene is obtained from 1-pentene by the method described in Example 6. The trimer is obtained from the oligomer mixture by fractionation.

To this end, triisobutyl aluminoxane is prepared in accordance with **EP-A- 575 356**. 35 g of a solution of isobutyl aluminoxane in heptane (3% by weight, based on Al; 38.9 mmol Al), 2.7 g trimethyl aluminium and 200 g 1-pentene are successively introduced into a reaction vessel under an inert gas, followed by the addition of solid bis-cyclopentadienyl zirconium(IV) chloride (3.2 g). After heating for ca. 22 h to 50°C, 10% hydrochloric acid is added while cooling with ice. The organic phase is removed, the solvent is distilled off and the oligomer mixture is fractionated. The trimer was

hydrogenated as described in Examples 1 – 5.

Example 8

560 g 2-ethyl-1-hexene is oligomerized with Lewatit® SPC 112 (Bayer AG) for 3 hours at 100°C/10 bar pressure. 380 g of the resulting mixture are hydrogenated with 100 bar hydrogen for 12 hours at 200°C in the presence of 0.05% palladium on coal. The mixture obtained after hydrogenation consists of 75% by weight dimer (= isohexadecane = C16), 20% by weight trimer (= isotetracosane = C24) and 5% by weight tetramer (= iso-C32-hydrocarbon).

Cosmetic compositions

The following emulsions can be prepared using the oligo- α -olefins of Example 1 as oil component:

15

Example 8 (o/w emulsion)

| | | |
|---|-------|-------------|
| Eumulgin® B2 | 2 | % by weight |
| Lanette® O | 5 | % by weight |
| Oligo-α-olefin | 16 | % by weight |
| 20 Glycerol | 3 | % by weight |
| Water | 73.85 | % by weight |
| Formalin (37%) | 0.15 | % by weight |

Example 9 (o/w emulsion)

| | | |
|---|-------|-------------|
| 25 Eumulgin® VL 75 | 4.5 | % by weight |
| Oligo-α-olefin | 16 | % by weight |
| Carbopol® | 0.3 | % by weight |
| KOH (20%) | 0.7 | % by weight |
| Glycerol | 3 | % by weight |
| 30 Water | 75.35 | % by weight |
| Formalin (37%) | 0.15 | % by weight |

Example 10 (w/o emulsion)

| | | | |
|---|---|-------|-------------|
| | Dehymuls® PGPH | 5 | % by weight |
| | Oligo-α-olefin | 20 | % by weight |
| | Glycerol | 5 | % by weight |
| | Mg sulfate · 7H ₂ O | 1 | % by weight |
| 5 | Water | 68.85 | % by weight |
| | Formalin (37%) | 0.15 | % by weight |

Examples of formulations which demonstrate the various potential applications of the cosmetic compositions according to the invention are presented in the following. All quantities represent percentages by weight of the commercially available substances in the composition as a whole.

Table 1: O/W sun protection emulsions[illegible]

Table 1 continued: O/W sun protection emulsions

[illegible]

Table 2: O/W sun protection emulsions

[illegible]

Table 2 continued: O/W sun protection emulsions

[illegible]

Table 3: W/O sun protection emulsions

| Component | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 |
|---|----|----|----|----|----|----|----|----|----|----|----|
| L = Lotion; C = Cream | C | L | C | L | C | L | L | L | L | C | C |
| Dehymuls [®] PGPH | 4 | 2 | 1 | 3 | 3 | 1 | 1 | 2 | 2 | 4 | 1 |
| Monomuls [®] 90-O18 | | | 2 | | | | | | | | |
| Lameform [®] TGI | 2 | | 4 | | 3 | | | | | 1 | 3 |
| Abil [®] EM 90 | | | | | | | 4 | | | | |
| Glucate [®] DO | | | | | | | | | | | 3 |
| Isolan [®] PDI | | | | | | 4 | | 2 | | | |
| Arlacel [®] 83 | | | | 2 | | | | | | | |
| Elfacos [®] ST9 | | | | | | | | | 2 | | |
| Elfacos [®] ST37 | | | | | | | | | | | |
| Arlacel [®] P 135 | | 2 | | | | | | | | | |
| Dehymuls [®] HRE 7 | | | | | | | | | | | |
| Zinc stearate | 1 | | | 1 | 1 | | | 1 | | 1 | |
| Microcrystalline wax | | | 5 | | | 2 | | | | | 5 |
| Beeswax | 1 | | | 1 | | | | 5 | | 7 | |
| Tego [®] Care CG | | | | | 1 | | | | | | .5 |
| Prisorine [®] 3505 | 1 | | 1 | 1 | | 1 | 1 | | | | 1 |
| Emery [®] 1780 | | | 5 | | | | | | | 4 | |
| Wool wax alcohol, anhydrous, USP | | | | | | | | | | | 1 |
| Antaron V 216 | 2 | | | | | | | | | | |
| Oligo-α-olefin (Example 1) | 3 | 4 | 2 | 1 | 10 | 2 | 2 | 6 | 3 | 12 | 1 |
| Myritol [®] PC | | | | | 3 | | | 4 | | | |
| Myritol [®] 331 | 10 | | | | 3 | 6 | | | | | 8 |
| Finsolv [®] TN | | | | 5 | | | 5 | | | | |
| Cetiol [®] CC | 12 | 22 | | | | 2 | | | 2 | | 5 |
| Cetiol [®] OE | | | | | 4 | | 5 | | 4 | 2 | |
| Dow Corning DC [®] 345 | | | | | | | 2 | | | | |
| Dow Corning DC [®] 2502 | | | 1 | | 2 | | | | | | |
| Prisorine [®] 3758 | | | | | | | | | | 2 | |
| Silikonöl Wacker AK [®] 350 | | | | 4 | | | | 3 | | | |
| Cetiol [®] 868 | | | | | | | | | | 2 | |
| Eutanol [®] G 16 | | 3 | | | | | | | | | |
| Eutanol [®] G 16S | | | | | | | | | | | |
| Cetiol [®] J 600 | | | 4 | | | 2 | | | | | |

Table 3 continued: W/O sun protection emulsions

[illegible]

Table 4: W/O sun protection emulsions

| Component | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 |
|-------------------------------------|----|-----|----|----|----|----|----|----|-----|----|----|
| L = Lotion; C = Cream | L | C | L | L | C | L | L | L | L | C | C |
| Dehymuls® PGPH | 3 | 1 | 5 | 1 | 1 | 3 | 2 | 4 | 0.5 | 1 | 4 |
| Monomuls® 90-O18 | | 1 | | | | | | | | | |
| Lameform® TGI | | | | | 4 | | | 1 | | 3 | 1 |
| Abil® EM 90 | | | | 1 | | | | | | 2 | |
| Glucate® DO | | | | 3 | | | | | 2 | | |
| Isolan® PDI | | 3 | | | | | 4 | | | | |
| Arlacel® 83 | | | | | | 3 | | | | | |
| Elfacos® ST9 | | | | | | | | | | | 2 |
| Elfacos® ST37 | 2 | | | | | | | | | | |
| Arlacel® P 135 | | | | | | 3 | | | | | |
| Dehymuls® HRE 7 | | | | | | | | | 4 | | |
| Zinc stearate | | 2 | 2 | 1 | 1 | | | 1 | 1 | | |
| Microcrystalline wax | | | | | 4 | | 1 | | | 4 | |
| Beeswax | | 4 | | 2 | | | 1 | | 2 | | 1 |
| Tego® Care CG | | | | | | | | | | | |
| Isostearic acid | 1 | 1 | | | | | 1 | 1 | | 1 | 1 |
| Emery® 1780 | | 7 | 3 | | | | | | | | |
| Wool wax alcohol, anhydrous, USP | | | | | | | | | | | |
| Antaron V 220 | | 0.5 | 2 | 1 | 1 | 1 | | | | | |
| Oligo- α -olefin (Example 1) | 2 | 4 | 3 | 3 | 2 | 2 | 1 | 3 | 3 | 1 | 4 |
| Myritol® PC | | | | | | | | | | | |
| Myritol® 331 | 4 | 2 | 3 | | 5 | | | 8 | 5 | 4 | |
| Finsolv® TN | | 5 | 5 | | | 7 | | | | | |
| Cetiol® CC | 3 | 1 | | | | | 3 | 16 | | | 12 |
| Cetiol® OE | | 3 | | 2 | | | 3 | | | | |
| Dow Corning DC® 345 | | 4 | | 2 | | | | | | | |
| Dow Corning DC® 2502 | | | | 1 | | | | | | | |
| Prisorine® 3578 | | 1 | | | | | | | | | |
| Silikonöl Wacker AK® 350 | | | | 1 | | | | | | | |
| Cetiol® 868 | | | | | | | | | | | |
| Eutanol® G 16 | | | | | | | | | | | 3 |
| Eutanol® G 16S | | | | | | | | | | | 7 |
| Cetiol® J 600 | | | | 3 | | | | | | | |

Table 4 continued: W/O sun protection emulsions

[illegible]

Table 5: W/O care emulsions

| Component | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 |
|--------------------------------------|----|----|----|----|----|----|----|----|----|----|-----|
| L = Lotion, C = Cream | C | L | C | L | C | L | L | L | C | C | C |
| Dehymuls [®] PGPH | 1 | 3 | 1 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1 |
| Monomuls [®] 90-O18 | 2 | | | | | | | | 2 | | 2 |
| Lameform [®] TGI | 4 | 1 | | | 3 | | | 1 | 4 | 3 | 3 |
| Abil [®] EM 90 | | | | | | | 4 | | | | |
| Isolan [®] PDI | | | | | | 4 | | | | | |
| Glucate [®] DO | | | | 5 | | | | | | | |
| Arlacel [®] 83 | | | 5 | | | | | | | | |
| Dehymuls [®] FCE | | | | | | | | | | | |
| Dehymuls [®] HRE 7 | | | | | | | | 4 | | 1 | |
| Zinc stearate | 2 | 1 | | 1 | 1 | | | 1 | 1 | 1 | |
| Microcrystalline wax | | | 5 | | | 2 | | | | | 5 |
| Beeswax | 4 | | | 1 | | | | 1 | 4 | 7 | |
| Tego Care [®] CG | | | | | 1 | | | | | | 0.5 |
| Prisorine [®] 3505 | | | 1 | 1 | | 1 | 1 | | | | 1 |
| Dry Flo [®] Plus | | | | | | | | | | | |
| SFE 839 | | | | | | | 3 | | | | |
| Emery [®] 1780 | 1 | | | | | | | | | | 1 |
| Lanolin; anhydrous USP | | | 5 | | | | | | | 4 | |
| Oligo- α -olefin (Example 1) | 3 | 4 | 2 | 12 | 10 | 2 | 2 | 6 | 3 | 12 | 1 |
| Cegesoft [®] C 17 | | | 3 | | | | | | | 1 | |
| Myritol [®] PC | | | | | | 2 | | 4 | | | |
| Myritol [®] 331 | 6 | | | | 2 | 6 | 2 | | | | 8 |
| Finsolv [®] TN | | | | 5 | | 2 | 5 | | | | |
| Cetiol [®] A | | 6 | | | | 4 | | | | | |
| Cetiol [®] CC | | 8 | | | 2 | 2 | 2 | | | | 5 |
| Cetiol [®] SN | | 5 | | | | | | 3 | | | |
| Cetiol [®] OE | 3 | | | | 4 | | 2 | | 4 | 2 | |
| Dow Corning DC [®] 345 | | | | | 1 | | 2 | | | | |
| Dow Corning DC [®] 2502 | | | 1 | | 2 | | | | | | |
| Prisorine [®] 3758 | | | | | 3 | | | | | | |
| Silikonöl Wacker AK [®] 350 | | | | 4 | | | | 3 | | | |

Table 5 continued: W/O care emulsions

[illegible]

Table 6: W/O care emulsions[illegible]

Table 6 continued: W/O care emulsions[illegible]

Table 7: O/W care emulsions

| Component | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 |
|---|-----|-----|-----|----|-----|-----|----|----|----|----|-----|
| L = Lotion, C = Cream | C | C | C | L | C | L | L | C | L | C | C |
| Eumulgin® VL 75 | | | | | | 4 | | | | | |
| Dehymuls® PGPH | | 2 | | | | | | | | | |
| Generol® R | | | 1 | | | | | | | | |
| Eumulgin® B2 | | | 0.8 | | | | | | | | |
| Tween® 60 | | | | 1 | | | | | | | |
| Cutina® E 24 | | | 0.6 | 2 | | | | | | | |
| Hostaphat® KL 340 N | | | | | | | | | 2 | | |
| Lanette® E | | | | | | | | 1 | | | |
| Amphisol® K | | 0.5 | | | | 1 | | | | 1 | 0.5 |
| Sodium stearate | | | | | 0.5 | | | | | | |
| Emulgade® PL 68/50 | | 2.5 | | | | | | | | 4 | |
| Tego® Care CG | | | | | | | | | | | 2 |
| Tego® Care 450 | | | | | | | | 5 | | | |
| Cutina® MD | | 1 | | 6 | 5 | | 4 | | | 6 | |
| Lanette® 14 | | | | 1 | | | | 2 | | | 4 |
| Lanette® O | 4.5 | | 4 | | 1 | 2 | | | | | 2 |
| Novata® AB | | 1 | | | | | | | | | 1 |
| Emery® 1780 | | | | | 0.5 | 0.5 | | | | | |
| Lanolin, anhydrous, USP | | | | | | | 5 | | | | |
| Cetiol® SB 45 | | | 1.5 | | | | 2 | | | | |
| Oligo-α-olefin (Example 1) | 3 | 4 | 2 | 1 | 10 | 2 | 2 | 6 | 3 | 12 | 1 |
| Cegesoft® C 17 | | | | | | | | | | | |
| Myritol® PC | | | | | 5 | | | | | | |
| Myritol® 331 | 2 | 5 | 5 | | | 6 | | 12 | | | |
| Finsolv® TN | | | 2 | | | 2 | | | 8 | | |
| Cetiol® CC | 4 | 6 | | | | 4 | 4 | | | | 5 |
| Cetiol® OE | | | | | | | | | 4 | 3 | |
| Dow Corning DC® 245 | | | 2 | | 5 | 1 | | | | | |
| Dow Corning DC® 2502 | | | | | 2 | 1 | | | | | |
| Prisorine® 3758 | | | | | | 1 | | | | | |
| Silikonöl Wacker AK® 350 | 0.5 | 0.5 | 0.5 | | | 1 | 4 | | | | |
| Cetiol® 868 | | | | | 2 | | 4 | | | | |
| Cetiol® J 600 | 2 | | 3 | | 3 | 2 | | | | 5 | |

Table 7 continued: O/W care emulsions[illegible]

Table 8: O/W care emulsions

| Component | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 |
|---|-----|----|----|----|----|----|----|----|----|----|----|
| L = Lotion, C = Cream | C | C | L | C | L | C | L | L | L | L | C |
| Eumulgin® VL 75 | 4 | 3 | | | | | 1 | | | | 2 |
| Generol® R | | | | | | 2 | | | | | |
| Eumulgin® B2 | | | | | | 2 | | | | 1 | |
| Tween® 60 | | | | | | | | | | 1 | |
| Cutina® E 24 | | | | 2 | | | | | | | |
| Hostaphat® KL 340 N | | | | | | | | | | | |
| Lanette® E | 0.5 | | | | | | | | | | 1 |
| Amphisol® K | 0.5 | 1 | | | | | | 1 | 1 | | |
| Sodium stearate | | | | | 1 | | | | | | |
| Emulgade® PL 68/50 | | 6 | | | | | | 5 | | | 4 |
| Tego® Care CG | | | | | | | | | | | |
| Tego® Care 450 | | | | | | | | | 4 | | |
| Cutina® MD | 3 | | 3 | 8 | 6 | 8 | | | | 4 | |
| Lanette® 14 | | 2 | | | | | | 2 | | 1 | |
| Lanette® O | 2 | | | 2 | | 3 | 1 | | 1 | 1 | 6 |
| Novata® AB | | | | | | | | | | | |
| Emery® 1780 | | | | | | | | | | | |
| Lanolin, anhydrous, USP | | | | | | 4 | | | | | |
| Cetiol® SB 45 | | | | | | | 2 | | | | |
| Oligo-α-olefin (Example 1) | 3 | 4 | 2 | 1 | 10 | 2 | 2 | 6 | 3 | 12 | 1 |
| Cegesoft® C 17 | 4 | | | | | | | | | | |
| Myritol® PC | 6 | | | | | 5 | | | 5 | | |
| Myritol® 331 | 5 | | 5 | | | | 7 | | | 10 | 3 |
| Finsolv® TN | | 5 | | | 5 | | | 3 | 3 | | 1 |
| Cetiol® CC | | | | | | | | | | | 2 |
| Cetiol® OE | | | | | 2 | | 2 | | 5 | | |
| Dow Corning DC® 245 | | 2 | | | 1 | | | | | 8 | 2 |
| Dow Corning DC® 2502 | | 1 | | | 1 | | | | | | 3 |
| Prisorine® 3758 | 3 | | | | | | | | | | 2 |
| Silikonöl Wacker AK® 350 | | | | | 1 | | | | | | 1 |
| Cetiol® 868 | | 2 | | | | | | | | | |
| Cetiol® J 600 | | 2 | | | | | | | | | |
| Ceraphyl® 45 | | | | | | | 3 | | | | |

Table 8 continued: O/W care emulsions[illegible]

Table 9: Spray formulations[illegible]

Table 9 continued: Spray formulations

| Component | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 |
|------------------------------|-------------------|----|----|----|----|----|----|----|-----|-----|-----|
| Veegum® Ultra | | | | | | | | | | | 1.5 |
| Laponite® XLG | | | | | | | | | | 1.5 | |
| Keltrol® T | | | | | | | | | | | 0.5 |
| Pemulen® TR 2 | | | | | | | | | 0.2 | | |
| Insect Repellent® 3535 | 1 | | | | | | | | | | |
| N,N-Diethyl-m-toluamide | 1 | | | | | | | | | | |
| Ethanol | | | | | | | | | | | |
| Butylene glycol | | | | | | | 1 | | | 2 | 1 |
| Glycerin | | | | | | 3 | 2 | 3 | 2 | | 3 |
| Water/ preservative/ NaOH | to 100/ q.s./ q.s | | | | | | | | | | |

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Table 10: Antiperspirant/deodorant formulations

[illegible]

APPENDIX

- | | |
|---|--|
| 1) Abil [®] EM 90 INCI: Cetyl Dimethicone Copolyol Manufacturer: Tego Cosmetics (Goldschmidt) | 10) Carbopol [®] ETD 2001 INCI: Carbomer Manufacturer: BF Goodrich |
| 2) Amphisol [®] K INCI: Potassium Cetyl Phosphate Manufacturer: Hoffmann La Roche | 11) Carbopol [®] Ultrez 10 INCI: Carbomer Manufacturer: Goodrich |
| 3) Antaron [®] V 220 INCI: PVP/Eicosene Copolymer Manufacturer: GAF General Aniline Firm Corp. (IPS-Global) | 12) Cegesoft [®] C 17 INCI: Myristyl Lactate Manufacturer: Cognis Deutschland GmbH, Grünau |
| 4) Antaron [®] V 216 INCI: PVP/Hexadecene Copolymer Manufacturer: GAF General Aniline Firm Corp. (IPS-Global) | 13) Ceraphyl [®] 45 INCI: Diethylhexyl Malate Manufacturer: International Specialty Products |
| 5) Arlancel [®] 83 INCI: Sorbitan Sesquioleate Manufacturer: Uniqema (ICI Surfactants) | 14) Cetiol [®] 868 INCI: Ethylhexyl Stearate Manufacturer: Cognis Deutschland GmbH |
| 6) Arlancel [®] P 135 INCI: PEG-30 Dipolyhydroxystearate Manufacturer: Uniqema (ICI Surfactants) | 15) Cetiol [®] A INCI: Hexyl Laurate Manufacturer: Cognis Deutschland GmbH |
| 7) Bentone [®] 38 INCI: Quaternium-18 Hectorite Manufacturer: Rheox (Elementis Specialties) | 16) Cetiol [®] B INCI: Butyl Adipate Manufacturer: Cognis Deutschland GmbH (Henkel) |
| 8) Carbopol [®] 980 INCI: Carbomer Manufacturer: Goodrich | 17) Cetiol [®] J 600 INCI: Oleyl Erucate Manufacturer: Cognis Deutschland GmbH |
| 9) Carbopol [®] 2984 INCI: Carbomer Manufacturer: Goodrich | 18) Cetiol [®] OE INCI: Dicaprylyl Ether Manufacturer: Cognis Deutschland GmbH |
| | 19) Cetiol [®] PGL INCI: Hexyldecanol, Hexyldecyl Laurate Manufacturer: Cognis Deutschland GmbH |

- 20) Cetiol® CC
INCI: Dicaprylyl Carbonate
Manufacturer: Cognis Deutschland GmbH
- 21) Cetiol® SB 45
INCI: Shea Butter Butyrospermum Parkii (Linne)
Manufacturer: Cognis Deutschland GmbH
- 22) Cetiol® SN
INCI: Cetearyl Isononanoate
Manufacturer: Cognis Deutschland GmbH (Henkel)
- 23) Cutina® E 24
INCI: PEG-20 Glyceryl Stearate
Manufacturer: Cognis Deutschland GmbH
- 24) Cutina® MD
INCI: Glyceryl Stearate
Manufacturer: Cognis Deutschland GmbH
- 25) Dehymuls® FCE
INCI: Dicocoyl Pentaerythrityl Distearyl Citrate
Manufacturer: Cognis Deutschland GmbH
- 26) Dehymuls® HRE 7
INCI: PEG-7 Hydrogenated Castor Oil
Manufacturer: Cognis Deutschland GmbH
- 27) Dehymuls® PGPH
INCI: Polyglyceryl-2 Dipolyhydroxystearate
Manufacturer: Cognis Deutschland GmbH
- 28) Dow Corning® 345 Fluid

- INCI: Cyclomethicone
Manufacturer: Dow Corning
- 29) Dow Corning® 245 Fluid
INCI: Cyclopentasiloxane
Cyclomethicone
Manufacturer: Dow Corning
- 30) Dow Corning® 2502
INCI: Cetyl Dimethicone
Manufacturer: Dow Corning
- 31) Dry®Flo Plus
INCI: Aluminium Starch Octenylsuccinate
Manufacturer: National Starch
- 32) Elfacos®ST 37
INCI: PEG-22 Dodecyl Glycol Copolymer
Manufacturer: Akzo-Nobel
- 33) Elfacos®ST 9
INCI: PEG-45 Dodecyl Glycol Copolymer
Manufacturer: Akzo-Nobel
- 34) Emery® 1780
INCI: Lanolin Alcohol
Manufacturer: Cognis Corporation (Emery)
- 35) Emulgade® PL 68/50
INCI: Cetearyl Glucoside, Cetearyl Alcohol
Manufacturer: Cognis Deutschland GmbH
- 36) Emulgade® SE-PF
INCI: Glyceryl Stearate, Ceteareth-20, Ceteareth-12, Cetearyl Alcohol, Cetyl Palmitate
Manufacturer: Cognis Deutschland GmbH
- 37) Eumulgin® B 2
INCI: Ceteareth- 20
Manufacturer: Cognis Deutschland GmbH
- 38) Eumulgin® VL 75
INCI: Lauryl Glucoside (and) Polyglyceryl-2 Dipolyhydroxystearate (and) Glycerin

Manufacturer: Cognis Deutschland GmbH

39) Eusolex® OCR
INCI: Octocrylene
Manufacturer: Merck

40) Eusolex® T 2000
INCI: Titanium Dioxide, Alumina, Simethicone
Manufacturer: Rona (Merck)

41) Eutanol® G
INCI: Octyldodecanol
Manufacturer: Cognis Deutschland GmbH

42) Eutanol® G 16
INCI: Hexyldecanol
Manufacturer: Cognis Deutschland GmbH

43) Eutanol® G 16 S
INCI: Hexyldecyl Stearate
Manufacturer: Cognis Deutschland GmbH

44) Finsolv® TN
INCI: C 12/15 Alkyl Benzoate
Manufacturer: Findex (Nordmann/Rassmann)

45) Generol® R
INCI: Brassica Campestris (Rapeseed) Sterols
Manufacturer: Cognis Deutschland GmbH

46) Glucate® DO
INCI: Methyl Glucose Dioleate
Manufacturer: NRC Nordmann/Rassmann

47) Hostaphat® KL 340 N
INCI: Trilaureth -4 Phosphate

Manufacturer: Clariant

48) Isolan® PDI
INCI: Diisostearoyl Polyglyceryl-3 Diisostearate
Manufacturer: Goldschmidt AG

49) Keltrol® T
INCI: Xanthan Gum
Manufacturer: CP Kelco

50) Lameform® TGI
INCI: Polyglyceryl-3 Diisostearate
Manufacturer: Cognis Deutschland GmbH

50) Lanette® 14
INCI: Myristyl Alcohol
Manufacturer: Cognis Deutschland GmbH

51) Lanette® E
INCI: Sodium Cetearyl Sulfate
Manufacturer: Cognis Deutschland GmbH

52) Lanette® O
INCI: Cetearyl Alcohol
Manufacturer: Cognis Deutschland GmbH

53) Monomuls® 90-0-18
INCI: Glyceryl Oleate
Manufacturer: Cognis Deutschland GmbH

54) Myrj® 51
INCI: PEG-30-Sterate
Manufacturer: Uniqema

55) Myritol® 331
INCI: Cocoglycerides
Manufacturer: Cognis Deutschland GmbH

56) Myritol® PC
INCI: Propylene Glycol Dicaprylate/Dicaprate
Manufacturer: Cognis Deutschland GmbH

57) Neo Heliopan® 303
INCI: Octocrylene
Manufacturer: Haarmann & Reimer

58) Neo Heliopan® AP
INCI: Disodium Phenyl
Dibenzimidazole Tetrasulfonate
Manufacturer: Haarmann & Reimer

59) Neo Heliopan® AV
INCI: Ethylhexyl Methoxycinnamate
Manufacturer: Haarmann & Reimer

60) Neo Heliopan® BB
INCI: Benzophenone-3
Manufacturer: Haarmann & Reimer

61) Neo Heliopan® E 1000
INCI: Isoamyl-p-Methoxycinnamate
Manufacturer: Haarmann & Reimer

62) Neo Heliopan® Hydro (Na-Salz)
INCI: Phenylbenzimidazole Sulfonic
Acid
Manufacturer: Haarmann & Reimer

63) Neo Heliopan® MBC
INCI: 4-Methylbenzylidene Camphor
Manufacturer: Haarmann & Reimer

64) Neo Heliopan® OS
INCI: Ethylhexyl Salicylate
Manufacturer: Haarmann & Reimer

65) Novata® AB
INCI: Cocoglycerides
Manufacturer: Cognis Deutschland
GmbH

66) Parsol® 1789
INCI: Butyl
Methoxydibenzoylmethane
Manufacturer: Hoffmann-La Roche
(Givaudan)

67) Pemulen® TR-2
INCI: Acrylates / C10-30 Alkylacrylate
Crosspolymer
Manufacturer: Goodrich

68) Photonyl® LS
INCI: Arginine, Disodium Adenosine
Triphosphate, Mannitol, Pyridoxine HCL,
Phenylalanine, Tyrosine
Manufacturer: Laboratoires Serobiologiques
(Cognis)

69) Prisorine® ISAC 3505
INCI: Isostearic Acid
Manufacturer: Uniqema

70) Prisorine® 3758
INCI: Hydrogenated Polyisobutene
Manufacturer: Uniqema

71) Ravcarb® 106
Polycarbonatdiol
Manufacturer: Enichem

73) SFE® 839
INCI: Cyclopentasiloxane and
Dimethicone/Vinyl Dimethicone
Crosspolymer
Manufacturer: GE Silicones

74) Silikonöl Wacker AK® 350
INCI: Dimethicone
Manufacturer: Wacker

75) Squatol® S
INCI: Hydrogenated Polyisobutene
Manufacturer: LCW (7-9 rue de l'Industrie
95310 St-Ouen l'Aumone France)

76) Tego® Care 450
INCI: Polyglyceryl-3 Methylglucose
Distearate
Manufacturer: Tego Cosmetics
(Goldschmidt)

77) Tego[®] Care CG 90
INCI: Cetearyl Glucoside
Manufacturer: Goldschmidt

78) Tween[®] 60
INCI: Polysorbate 60
Manufacturer: Uniqema (ICI
Surfactants)

79) Uvinul[®] T 150
INCI: Octyl Triazone
Manufacturer: BASF

80) Veegum[®] Ultra
INCI: Magnesium Aluminium Silicate
Manufacturer: Vanderbilt

81) Z-Cote[®] HP 1
INCI: Zinc Oxide, Dimethicone
Manufacturer: BASF